

**In the Claims:**

Please amend Claims 1 and 2 as follows:

1. (Amended) A polymer membrane for the separation of components of natural gas, that comprises an asymmetric hollow fiber of polyethersulphone for the purposes of pervaporation, treated with mixtures of liquids comprising  $C_2H_5OH$  and X, in which X is toluene, acetone, or dimethylformamide, with a content of X equal to 7 - 12% by volume in the mixture, subsequently treated with a solution at 2.5% of urethanosiloxane in isopropyl alcohol.

2. (Amended) A polymer membrane according to claim 1, characterised in that a hollow fibre membrane of polyethersulphone is used, modified with a gaseous mixture comprising  $F_2$  and HF with content of  $F_2$  and HF in the range of 0-90% by volume, and concentration of HF in fluorine of 4-6% by volume.

Please add the following claims:

3. (New) A polymer membrane for the separation of components of natural gas or hydrogen-methane-containing gaseous mixture, prepared by a method comprising: (a) providing an asymmetric hollow fiber of polyethersulphone which possesses a first hydrogen-methane selectivity; (b) treating the fiber with mixtures of liquids comprising  $C_2H_5OH$  and X, in which X is toluene, acetone, or dimethylformamide, with a content of X equal to 7 - 12% by volume in the mixture; and (c) subsequently treating the fiber with a solution at 2.5% by volume of urethanosiloxane in isopropyl alcohol, such that after treatment the membrane exhibits a second hydrogen-methane selectivity at least 40 times higher than the first hydrogen-methane selectivity.

4. (New) A polymer membrane according to claim 1 wherein the hollow fiber membrane of polyethersulfone is modified with a gaseous mixture with a content of inert gas in the range of 0-90% by volume, and a concentration of HF in fluorine of 4-6% by volume.

5. (New) A process for the treatment of a porous polymer membrane comprising: (a) providing an asymmetric hollow fiber of polyethersulphone which possesses a first hydrogen-methane selectivity; (b) treating the fiber with mixtures of liquids comprising  $C_2H_5OH$  and X, in which X is toluene, acetone, or dimethylformamide, with a content of X equal to 7 - 12% by volume in the mixture; and (c) subsequently treating the fiber with a solution at 2.5% by volume of urethanosiloxane in isopropyl alcohol, such that after treatment the membrane exhibits a second hydrogen-methane selectivity at least 40 times higher than the first hydrogen-methane selectivity.

6. (New) The process according to claim 5, wherein the hollow fiber membrane of polyethersulfone is modified with a gaseous mixture with a content of inert gas in the range of 0-90% by volume, and a concentration of HF in fluorine of 4-6% by volume.